Indiana Dairy Strategy – Summary

Prepared for: Indiana State Department of Agriculture
March 16, 2015

Indiana Dairy Strategy - Summary

INDIANA STATE DEPARTMENT of AGRICULTURE

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Document prepared with data compiled as of October 2014 – March 2015.

Contents

Contents

Contents

Tables and Figures

1. Executive Summary

1.1 Background

- Most of the milk in Indiana is bottled and consumed as fluid milk, either in Indiana, or exported to fluid milk markets in the east and south east

- Indiana is the number two ice cream producer in the nation, after California. However ice cream consumption is stagnant to declining

- Approximately 4 million pounds of milk per day (40% of Indiana milk) is exported from Indiana, mainly to fluid milk markets in the east and southeast

- Declining fluid milk consumption, recent dairy processing expansions in Michigan, and a lack of dairy processing facilities in the state, could bring the viability of dairy expansion in Indiana into question unless additional processing capacity is added

1.2 Implications & Recommendations

- There appears to be an opportunity to encourage investment in dairy processing in Indiana for up to 4 million pounds of milk that is currently exported out of the state. A new facility may be sized initially at 1-2 million pounds per day, with a view to expand in the future as milk production and demand allows

- Potential investments could be in cheese, by-products, and possibly yogurt production, capitalizing on competitively priced milk, and proximity to large population East Coast markets

- Benefits to investors locating cheese or yogurt production in Indiana include:
  - Proximity to US East Coast consumer and foodservice markets
  - Proximity to cut-and-wrap cheese facilities in the east (Indiana cheese production would reduce transportation costs of bulk cheese compared to cheese from the Upper Midwest and west of the Mississippi)
  - Possible export opportunities for cheese into the Caribbean and Middle East markets due to logistical advantages over Wisconsin and West Coast cheese producers

- Partner with progressive farmers who have access to good quality feed stock and employ best practice farm management and sustainable farming practices
- Competitive (and potentially stable) milk price
- Modernized plants
- Ability to further expand dairy production as demand increases with a supportive regulatory environment
- Access to a skilled, stable workforce
- Economic development support from the State of Indiana

↘ The State of Indiana would need to support dairy processing and milk production expansion with a variety of programs:

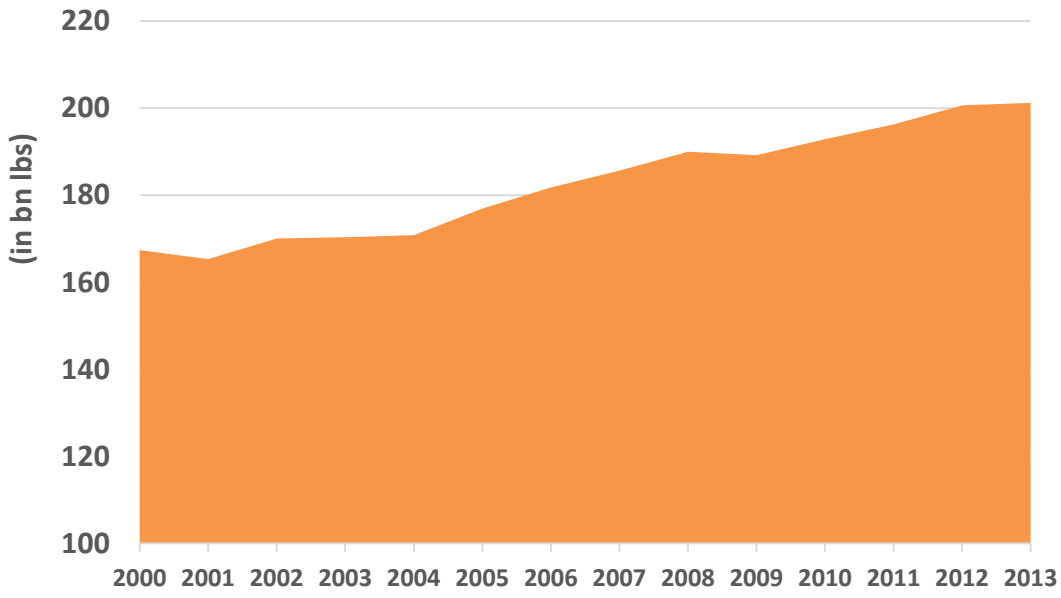
- Facilitate a coordinated approach among farmers, cooperatives, dairy processors and feed providers to create the right climate for milk production and dairy processing expansion
- State supports the effort to improve milk quality at small farms through education and improved systems
- Support the industry with dairy specific programs at the university and technical college levels
- Package economic development incentives to encourage capital investment and creation of jobs in Indiana

2. US Dairy Landscape

2.1 US Milk Production

- U.S. milk production totaled 201.2 billion pounds in 2013, up just 0.6% vs. 2012
- The Compound Annual Growth Rate (CAGR) for U.S. milk production from 2000 – 2013 is 1.4%
- The growth in the U.S. milk supply during 2013 was below trend due to lower farm-level profitability during the first half of the year in Western states and poor feed quality/climate issues east of the Rockies during the second half of the year
- Lower-than-trend growth in milk output in the United States as well as in Europe and Oceania contributed to the unprecedented rise in U.S. milk prices to record levels in 2014
- USDA forecasts U.S. milk production to increase 2.4% in 2014 to 206.1 billion pounds

Figure 2.1 US Annual Milk Production 2000 - 2013

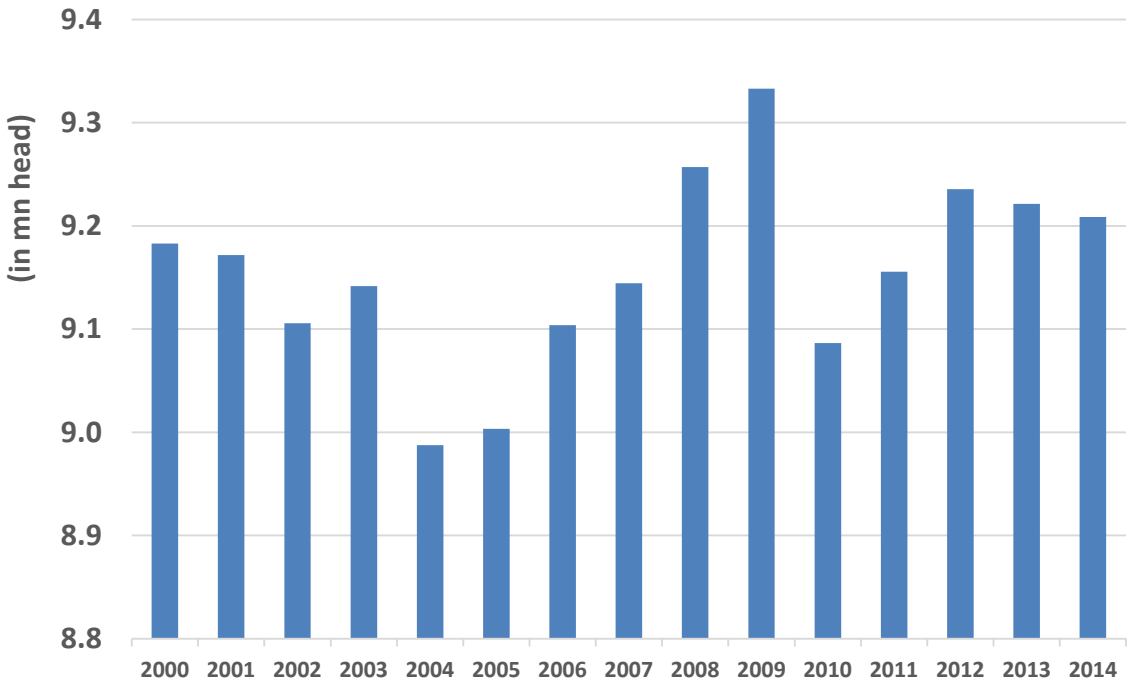


Source: USDA / NASS

2.2 US Dairy Herd

- The U.S. dairy herd averaged 9.221 million head in 2013
- From 1980 to 2000, the dairy herd declined by 0.8% annually
- The decline in cow numbers was offset by a 2.1% increase in milk per cow
- Since 2000, the annual average size of the U.S. dairy herd has ranged from 9.012 million cows to 9.334 million cows – this represents a 3.6% variance in the dairy herd over more than a decade time span, which is minimal
- USDA estimates that the U.S. dairy herd grew by 34,000 head in 2013, a gain of 0.4%
- In most years the U.S. dairy herd fluctuates by less than 1%. Therefore the predominate contribution to increased milk production comes from greater productivity per cow

Figure 2.2 US Dairy Herd (as of January 1 each year)

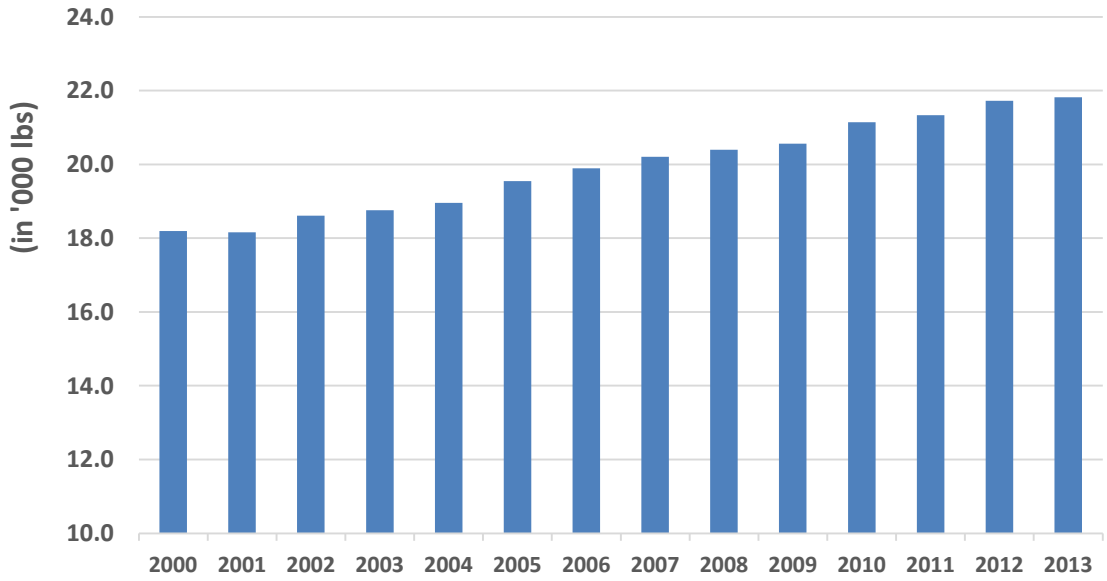


Source: USDA / NASS

2.3 US Milk per Cow

- Output per cow averaged 21,822 pounds in 2013, just 0.5% greater than the prior year
- The CAGR for milk per cow has slowed as the U.S. average has exceeded 20,000 pounds
  - The 1980 – 2000 CAGR was 2.1%
  - The 1990 – 2010 CAGR was 1.9%
  - The 2000 – 2013 CAGR was 1.3%
- Individual dairy states with herd averages in excess of 20,000 pounds have typically increased output per cow by 1%
- As the number of U.S. dairy farms has declined and a greater percentage of the U.S. milk production originates from professionally managed herds, gains in output per cow will be based upon maximizing profits not necessarily production
- Gender-selected semen and genomics are likely to be a management tools that will aid gains in milk per cow in addition to nutrition tools

Figure 2.3 US Milk Production per Cow (annual average)



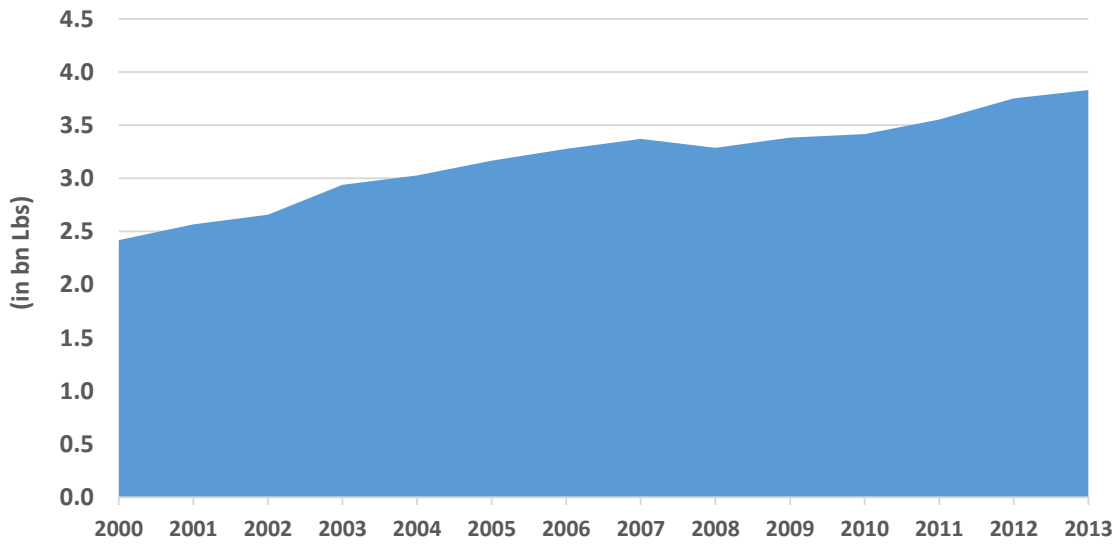
Source: USDA / NASS

3. Indiana Dairy Landscape

3.1 Indiana Milk Production

- In 2013, Indiana ranked as the 14th largest milk producing state in the nation and accounted for 1.9% of total U.S. milk production
- 2013 milk production totaled 3.8 billion pounds, up 2.4% versus 2012
- Indiana's milk production CAGR from 2000 – 2013 was 3.6%
- Indiana's per capita milk production was 583 pounds in 2013 versus 637 pounds as the national average – this level of output puts Indiana's per capita milk production up 13% compared to 2008
- Only 22 states achieved gains during that period with Indiana ranking as the 6th largest gain behind Georgia, Hawaii, Kansas, Michigan and Wisconsin
- Between 2008 and 2013 Indiana ranked as the 4th largest milk production increase (+18.4%) compared to the national average production increase of just 5.9% over that same period

Figure 3.1 Indiana Milk Production 2000 - 2013

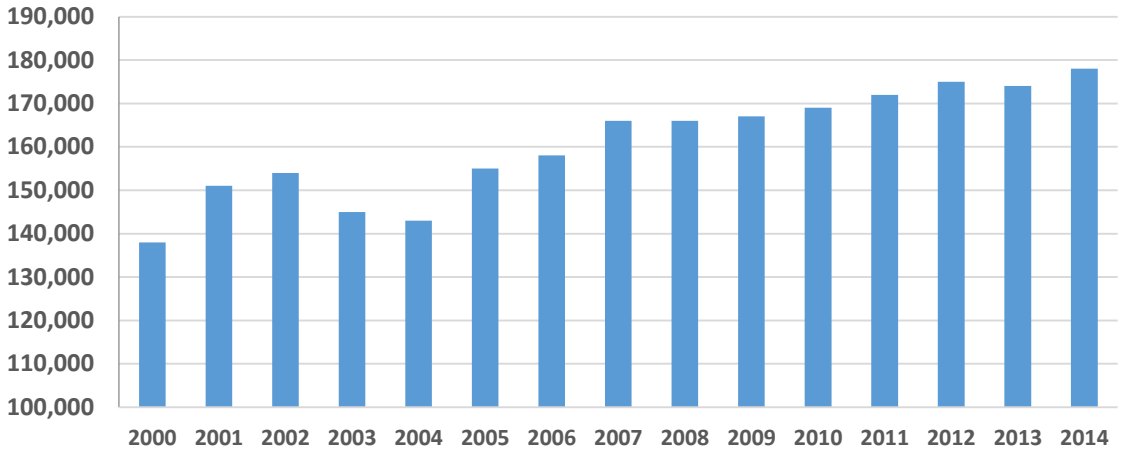


Source: USDA / NASS

3.2 Indiana Dairy Herd

- The Indiana dairy herd has been growing steadily since 2005 at 1.8%, with most of the growth coming in the north
- At the start of 2014, the Indiana dairy herd stood at 178,000 cows
- The top 10 counties account for 62.5% of the state's total milking herd in 2013
- Indiana had 1,425 licensed dairy operations in 2013 according to USDA. This puts Indiana's average herd size at 121 cows

Figure 3.2a Indiana Dairy Herd 2000 – 2014 (as of January 1)



Source: USDA/NASS

Table 3.2b Cows by Indiana Region 2004 & 2013

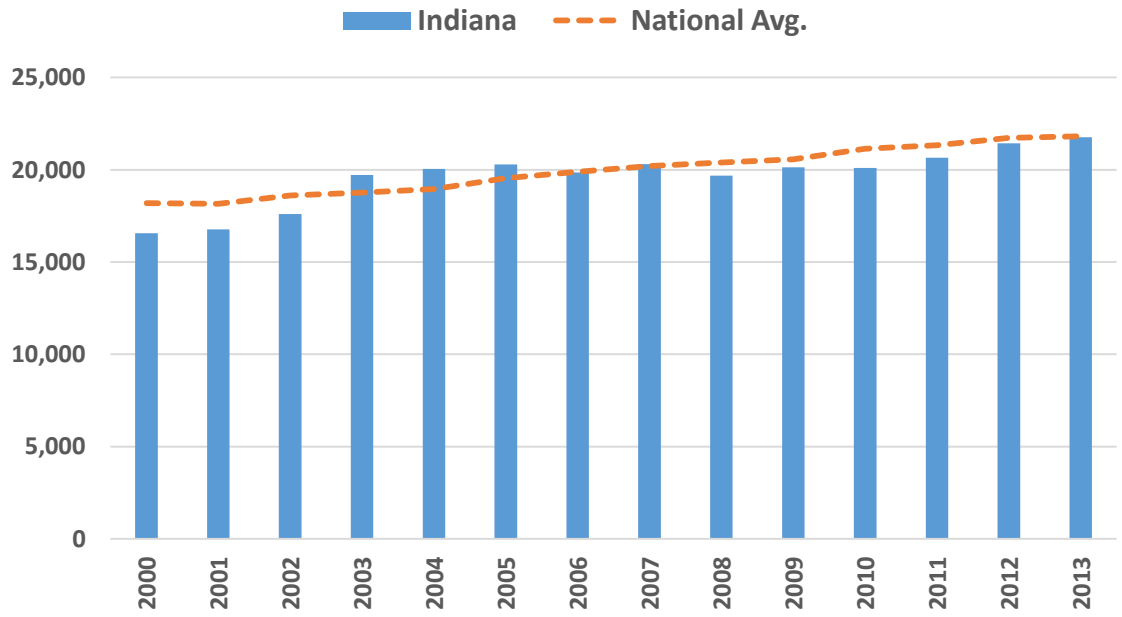
Region	2004 Cows	2013 Cows	% Chg.
North	108,400	130,500	+20%
Central	18,100	20,500	+13%
South	16,800	22,000	+31%

Source: USDA / NASS

3.3 Indiana Milk Production per Cow

- Indiana output per cow averaged 21,761 pounds in 2013, nearly equal to the national average of 21,822
- Milk production per cow has averaged more than 20,000 pounds in Indiana since 2009
- 2013 production gains were 1.5% compared to the national average of 0.5% vs. the prior year
- Between 2000 and 2013 Indiana production per cow had a 2.1% CAGR. This growth is outpacing the national average at 1.4% over the same period. Expansion of large dairy operations has likely contributed to production per cow gains

Figure 3.3 **Milk Production per Cow 2000 – 2013 (Indiana vs. National Average)**

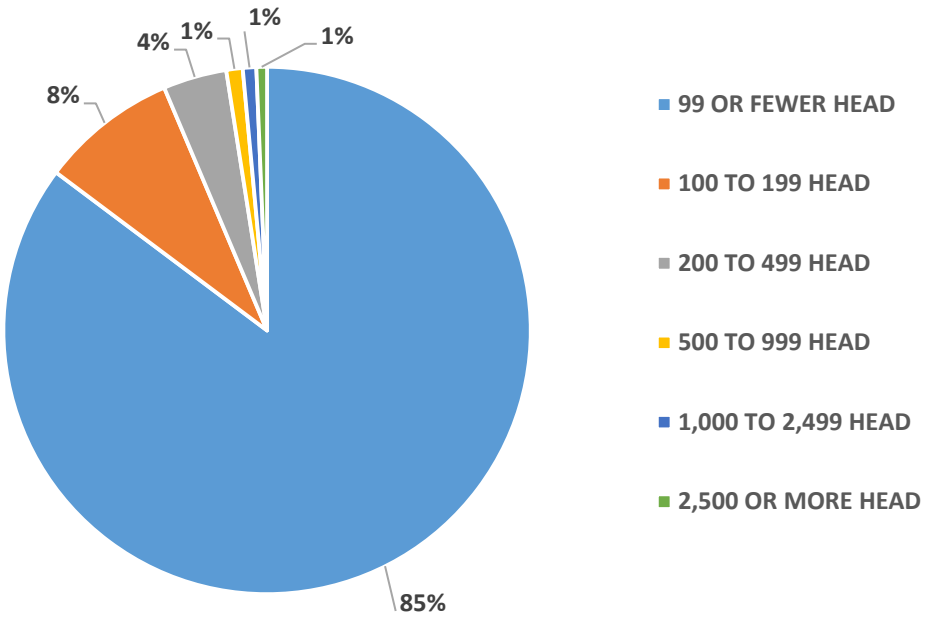


Source: USDA/NASS

3.4 Indiana Dairy Operation Size

- Indiana dairies generated $658.4 million in milk sales in 2012
- Dairies with fewer than 100 cows comprises 85% of Indiana's dairy operations; however these farms contributed to just 11% of milk sales revenue in 2012
- Almost 50% of milk sales revenue in Indiana is from dairy farms with >1000 cows

Figure 3.4a Indiana Dairy by Size of Operation



Source: USDA / NASS

Table 3.4b Indiana Dairy Farms by Size

Dairy size	% Farms	% Revenue
<100 Head	85%	11%
100 to 199 head	8%	10%
200 to 499 head	4%	10%
500 to 999 head	1%	7%
1,000 to 2,499 head	1%	14%
>2,499 head	1%	35%

Source: USDA / NASS

3.5 Milk Production by Region

3.5.1 Northern Indiana

- Northern Indiana has most of the dairy farms in Indiana accounting for 75% of total estimated cows. However, the actual number of cows in northern counties could be higher. Newton County reported 12,400 cows in 2004 but has since stopped reporting due to disclosure issues. This county is home to Fair Oaks Dairy
- Northern Indiana is home to 10 counties with more than 15,000 cows and six with 9,000 to 14,999 cows
- Most CFO permitted farms are in this region of the state
- New dairy processing capacity would likely be located in northern Indiana due to proximity to existing dairy production and propensity for growth

Table 3.5.1a Milk Production in Northern Indiana

	2013
Milk production (1,000 pounds)	~3,175,968
Cows	130,500*
Dairies (in Dec 2013)	783**

Source: USDA / NASS,
** Estimated as USDA data excludes Newton County. Total cows is estimated as the total for Indiana less Central and Southern Indiana.*
*** Estimated 2012 Census puts 1,651 dairy operations in this region. However, Census includes all operations that have at least one cow and many of these are not commercial dairy operations. 798 operations from this region were pooled on FMMO 33 in March 2013, averaging 95 cows. 31 dairies in this region have more than 500 cows. It is likely that the dairies in this region with more than 500 cows that ship tanker load quantities of milk are pooled on the Southeast FMMO.*

Figure 3.5.1b County Map of Northern Indiana

3.5.2 Central Indiana

- For counties reporting dairy cow numbers, Central Indiana has 12% of total cows for the state
- Most of the herds are less than 100 cows, with the average herd size is approximately 60 dairy cows
- This region has maintained its cow numbers between 2004 and 2013

Table 3.5.2a Milk Production in Central Indiana

	2013
Milk production (1,000 pounds)	402,485
Cows	20,500*
Dairies (in Dec 2013)	184**

Source: USDA / NASS
** Estimated.*
*** Estimated. 2012 Census puts 393 dairy operations in the Central region. 41% of these operations have one to nine head of dairy cattle. Only six operations have more than 500 dairy cows. In March 2013, 183 dairies from the Central region were pooled on the Mideast FMMO. The average dairy farm had approximately 60 dairy cows.*

Figure 3.5.2b County Map of Central Indiana

3.5.3 Southern Indiana

- Southern Indiana is characterized by very few small to midsized farms
- Southern counties account for just 13% of total reported cows
- The region has 357 dairy operations but is home to just two dairies with more than 500 head. Over half the dairies in this region have less than nine head. 29 dairies were pooled on the FMMO in March 2013 and these dairies averaged about 50 cows

Table 3.5.3a Milk Production in Southern Indiana

	2013
Milk production (1,000 pounds)	181,683
Cows	22,000
Dairies	29

Source: USDA / NASS, cows potentially overstated by 4,000 head which represents heifer raising operations.

Figure 3.5.3b County Map of Southern Indiana

3.6 Confined Feeding Operations

- In Indiana, Confined Feeding Operation (CFO) permits are issued for farms with 300 or more cows.
- There are 90 CFO dairies in the State, with most of these dairies in the northern region of the state
- Previously permitted CFO beef operations may be an opportunity to convert to dairy to expand the State's dairy production

Table 3.6 CFO Dairy Farms in Indiana 2014

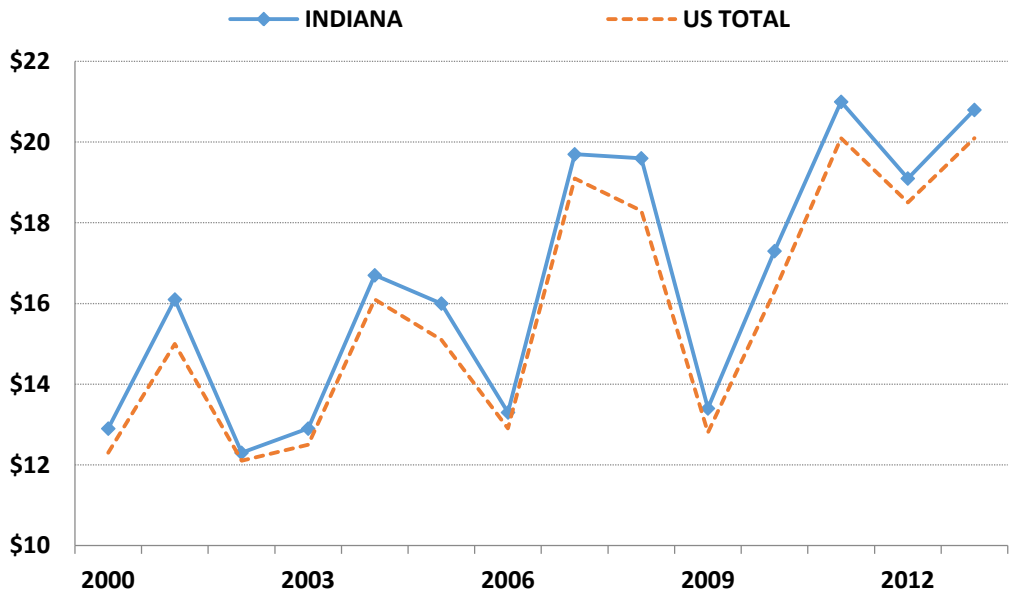
	2014
Dairies	90
Cows	120,836
Avg. Herd Size	1,400

Source: State of Indiana Department of Environmental Management, July 2014

3.7 Indiana Milk Price

- Indiana is in the Mideast Federal Milk Marketing Order (FMMO 33)
- Due to the higher Class I utilization in the order, nearly 40% of a farms milk check will be based on the Class I price. As a result, Indiana's milk prices (along with Michigan and Ohio) are higher than the national average
- Some manufacturers in surrounding regions are approaching farms to be paid on either a cost-adjustor basis or a Class III basis rather than federal order pricing. This approach is limited to Class II, III and IV processors. It is likely that new manufacturing investments in the state of Indiana would require this sort of pricing

Figure 3.7 **All Milk Price, Indiana vs. National Average 2000 – 2012 ($/cwt)**



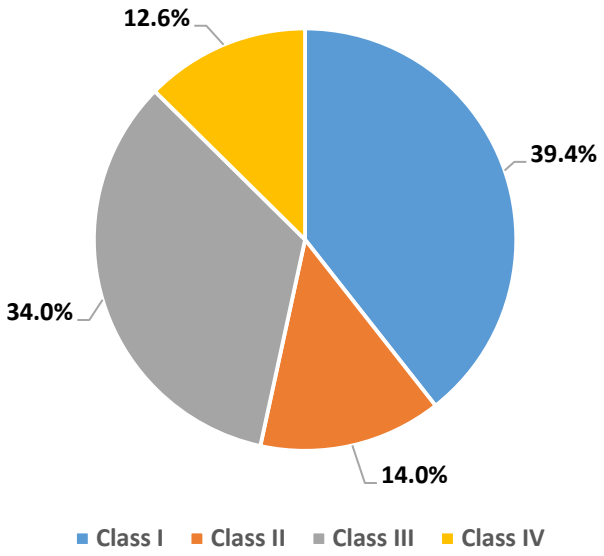
Source: USDA / NASS

3.8 Indiana Milk Utilization

- Most milk in Indiana's milk goes to fluid bottlers, consistent with most of the milk production in the milk marketing order. Bottling plants have limited processing capacity and are subject to fluctuations in demand (7% of fluid milk sales are related to school lunch programs, so demand reduces in June when the kids are out of school; and ramps up from August 10 – September 15 as bottlers fill up the fluid milk pipeline when kids go back to school)

- Indiana has very little Class III milk utilization, as there are no major cheese plants in the state. All of the plants are small scale (e.g. Deutsch Kase Haus, Swissland) or farmstead cheese operations in 2014
- There is a significant amount of ice cream produced in Indiana (Indiana is the 2nd largest ice cream producing state after California) accounting for most of the Class II butterfat utilization
- Indiana does not have significant yogurt production (which also uses Class II milk) outside of some processing by Prairie Farms. Class II ice cream demand has declined modestly (smaller ice cream cartons, light ice cream). The outlook for class II utilization is stable but is not growing
- Indiana does have some Class IV production, as DFA operates a condensed/non-fat dry milk powder plant in Goshen, Indiana. It's likely that DFA uses this plant to balance the local milk supply and operates the plant as a balancing operation so the output will be very limited at times. The stated plant capacity is approximately 1 million pounds of milk per day. However this is an older plant and this site is at risk as DFA is adding condensing capacity in Michigan

Figure 3.8 FMMO 33 Milk Utilization



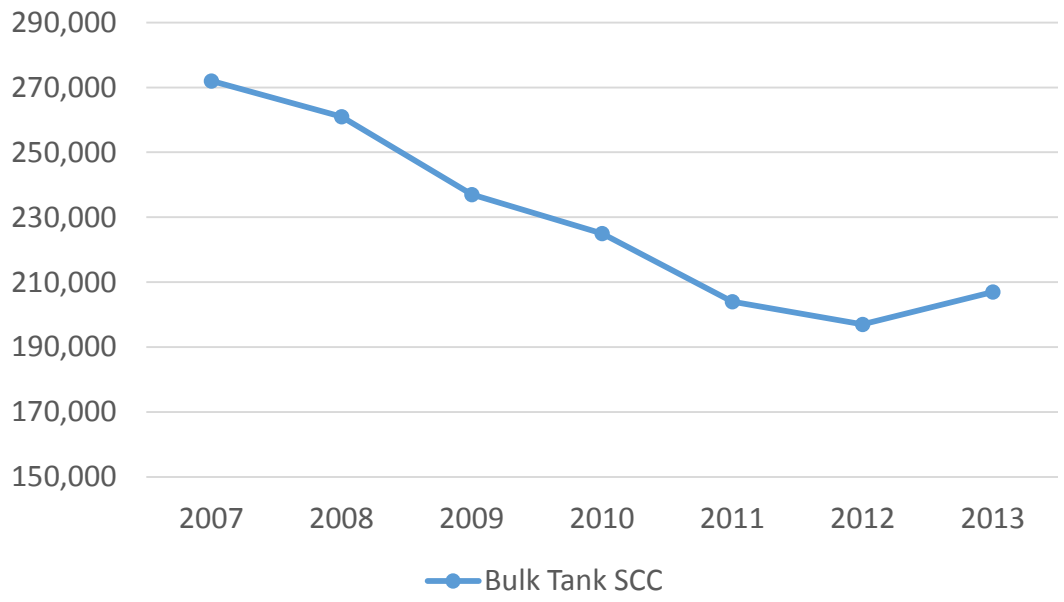
Source: FMMO 33
Note: this covers the entire FMMO 33 which includes milk in Indiana, Ohio and Michigan.

3.9 Indiana Milk Quality

- According to Dairy Herd Improvement Association (DHIA), Indiana's state average Somatic Cell Counts (SCC) was 207,000
- Michigan's average SCC was 165,000 and Ohio was 207,000

- The national SCC average 199,000
- Michigan was the only state in the upper Midwest and northeast milk marketing order to have less than 200,000 SCC

Figure 3.9 Bulk Tank Somatic Cell Counts - Indiana (2000 – 2013)



Source: USDA / NASS

3.10 Control of Indiana Dairy Supply

- In 2013 dairy cooperatives in the US marketed 78% of the nation's milk supply
- Although Indiana has a few small milk marketing cooperatives, most farms sell to one of the major cooperatives. DFA, Michigan Milk Producers Association, Select Milk Producers and Prairie Farms are the dominant cooperatives in the region

Table 3.10 Dairy Cooperatives in the Region

Processor	Estimated total US milk handled (bn lbs.)	National Rank
Dairy Farmers of America	45.3	1
FarmFirst Dairy Cooperative	12.0	4
Continental (Select)	6.0	6
Foremost Farms	5.7	9
Michigan Milk Producers Association	4.0	12
Prairie Farms	1.7	21

Source: Hoard's Dairyman 2013 w/DDR update for mergers this year

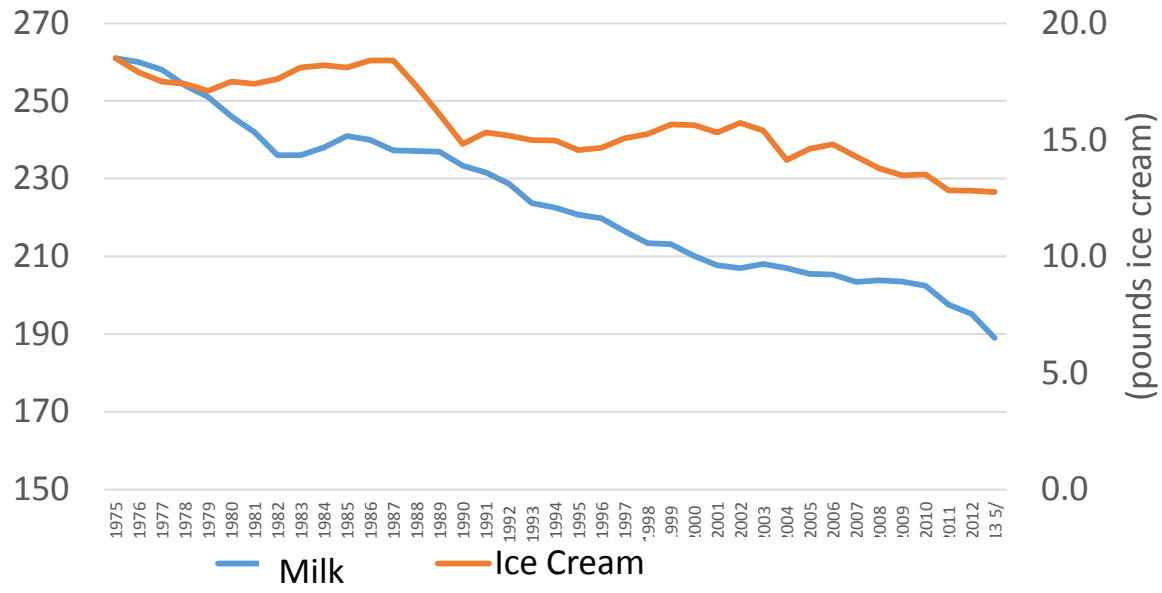
- In September 2014 Select Milk Producers and Continental Dairy Products merged. The new cooperative is Select Milk Producers, Inc:
  - Prior to the merger Continental Dairy Products had 36 large farmer members, with 76,000 milking cows, producing 2 billion pounds of milk per year
  - Prior to the merger Select had 61 large farmer members, with 136,000 milking cows and 4.3 billion pounds of milk per year
  - Fair Oaks Farms, which has a high profile in the State, is a supplier to Select Milk Producers
  - Mike McCloskey is CEO of Select and Chairman of Fair Oaks Farms, which is his home dairy

3.11 Indiana Milk Processors

- Indiana processors focus primarily on consumer products
- The types of production facilities in Indiana could be a limiting factor to milk production growth in the state
  - Currently most of the plants are fluid bottling or ice cream plants
  - U.S. fluid consumption is declining
  - Most fluid plants currently have excess capacity due to increased competition for the remaining demand

– Fluid dairy products are the most expensive to transport long distances – therefore most of this product is destined for the local and regional market

Figure 3.11a **US Fluid Milk and Ice cream Per Capita Consumption (1975-2013)**



Source: USDA / NASS

- Indiana has 21 processing plants
  - Three specialty cheese plants
  - Eight ice cream plants
  - Seven fluid milk processors
  - One plant making Reddi-wip
  - One condensed/milk powder plant
  - One ice cream and fluid milk processor
- Additionally, Indiana has 14 farmstead operations
- Indiana has six of *Dairy Food's* top 100 processors with operations

Figure 3.11b **Major Dairy Processors in Indiana**

Source: Orrani Consulting
Fair Oaks is a major milk supplier in the State

Figure 3.11c Dairy Processing Locations in Indiana

Red - Milk Powder, Yellow - Cut & Wrap Cheese, Green - Fluid Milk, Purple – Ice cream, Blue – Reddi-wip
Source: USDA Plant Listing, FMMO 33, Mideast Pool Plants

3.11.1 Nestle

- Nestle has an annual revenue of $10 billion and is ranked # 1 in Dairy Top 100
- Nestle has nine plants in the US, including two in California, two in Indiana, and a plant in each of the following states; Illinois, Iowa, Maryland, New Jersey and Utah
- Nestle's product line includes ice cream, frozen desserts, novelties, and milk based beverages
- Nestle operates two dairy operations in Indiana
  - Edy's ice cream plant (Fort Wayne)
  - Nesquik and Coffeemate plant (Anderson) – this plant is the sole producer of these products in North America
- In 2013 Nestle invested $4.5 million in expanding the Edy's plant, which receives primarily cream
- In 2013 Nestle invested $72 million in the Anderson facility to add a seventh production line (operational 2014)

3.11.2 Dean Foods

- Dean Foods has an annual revenue of $9 billion, and is ranked # 3 in Dairy Top 100
- Dean Foods has 69 plants, three of which are located in Indiana
  - Decatur plant makes ice cream and frozen desserts
  - Huntington plant processes and bottles fluid milk
  - Rochester processes, bottles and packages fluid milk and cottage cheese
- Nationally their product range includes bottled milk, ice cream, cultured products, creamers, juice, bottled waters and teas

3.11.3 Dairy Farmers of America

- Dairy Farmers of America (DFA) has annual revenue of $3.2 billion and is ranked # 10 in Dairy Top 100. It is the number one dairy cooperative in the United States
- DFA has 34 plants, including one in Goshen, Indiana that produces condensed milk, cream and nonfat dry milk
- While DFA has just one plant in Indiana, DFA primarily markets milk to other processors, their largest customers include Dean Foods and Nestle

3.11.4 Prairie Farms

- Prairie Farms has annual revenue of $2.8 billion. It is a farmer owned cooperative and is ranked # 11 in Dairy Top 100 and is the number 20 dairy cooperative in the United States

- Prairie Farms has 36 plants which produce milk, ice cream, cultured products, creamers, juice, bottled waters and teas
- Prairie Farms operates four sites in Indiana
  - Anderson – fluid milk, ice cream mix and yogurt
  - Ft. Wayne – fluid milk, ice cream mix and yogurt
  - Holland – fluid milk
  - Lafayette – ice cream novelties
- Prairie Farms also markets milk to other plants in the region

3.11.5 Kroger

- Kroger has annual revenue of $9 billion and is ranked # 3 in Dairy Top 100
- Kroger has 69 plants producing milk, ice cream, cultured products, process cheese, cut & wrap / shredded cheese, creamers, juice, bottled waters and teas
- Kroger operates two milk processing plants in Indiana. The Crossroads Farms plant houses both a fluid milk plant and an ice cream plant. Kroger also has a cheese cut and wrap plant (Pace Dairy Foods) in Crawfordsville
- Kroger is supplied by Select Milk Producers in nearly all of its processing facilities – this provides Select a competitive advantage in pooling milk on different orders to obtain the highest milk price possible for its members

3.12 Out of State Milk Shipments

- According to the Mideast Market Administrator, only 1.9 billion pounds of milk was pooled on the order – just half of the milk
  - Indiana shipped about 25% of its milk supply to Appalachian orders in 2013
  - Indiana shipped approximately 15% of its milk supply to the Southeast in 2013
  - It is likely that Indiana milk is also shipped to Florida; however, the market administrator does not publish that data
- Indiana is a net exporter of milk supply to regions typically deficit in milk supply
  - Due to the high Class I utilization in those markets, it is highly lucrative for cooperatives to supplement milk supply in other regions
- Indiana currently has sufficient milk supply to support an additional 4 million pounds of milk per day of processing within the state
- This year Foremost Farms USA and Michigan Milk Producers Association formed a strategic alliance to invest in balancing milk in the Mideast, including Indiana

- Foremost Farms has invested in reverse osmosis technology at MMPA's Constantine, MI plant. The concept is to concentrate the milk before hauling it to Foremost's cheese plants in Wisconsin for processing

➘ Out of state milk shipments by Indiana dairies include:

- Select milk is shipped to its plant in Michigan, and to Kroger in Indiana, Kentucky and Tennessee
- Michigan Milk Producers milk goes to its plant in Michigan, and on to Foremost Farms in Wisconsin
- Foremost milk is mostly committed to Nestle and Foremost Farms in Wisconsin. Some goes to Prairie Farms Anderson
- Dean's milk goes to Dean's plants in Indiana and Kentucky
- Prairie Farms milk is mainly used by Prairie Farms
- DFA is shipping to plants in Indiana and neighboring states (especially Meijer in Cincinnati)
- Two larger Indiana dairies ship to Chula Vista in Chicago
- Two larger Indiana dairies ship to Dannon in Ohio

3.13 Former Indiana Dairy Processing Facilities

➘ There are no former facilities that are suitable for reopening as dairy processing facilities

Table 3.13 Former Indiana Grade A Dairy Processing Facilities

Plant Name	Best information	City	Co	Decommissioning date
Country Fresh/Burger Div	Repurposed - manufacturing	New Paris	Elkhart	1/1/03
Unilever-Good Humor Breyers	Repurposed for another food processing use	Huntington	Huntington	7/29/13
Dixie Dairy	Dilapidated & stripped of equipment	Gary	Lake	6/5/02
CIF/Correctional Indiana Facility	Prison system dairy, equipment gone?	Pendleton	Madison	1/1/07
Maplehurst Dairy	Building gone	Indianapolis	Marion	7/1/99
Banquet Dairy	Building gone	Indianapolis	Marion	11/3/98
Milkco Inc	Building gone	Union City	Randolph	1/1/03
Ideal American Dairy	Building gone	Evansville	Vanderburgh	7/1/05

Source: Indiana State Board of Animal Health

4. Strengths & Opportunities

4.1 Strengths

- Indiana ranks # 1 in the shortest distance to the median center of the U.S. population
- Known as the “Crossroads of America,” Indiana ranks in the top 10 in 46 significant logistics related categories across the U.S., is a national leader in pass-through interstates, home to the 2nd largest FedEx air hub worldwide, and 3rd in total freight railroads
- Home to large, well-capitalized, progressive dairy farms with the ability to grow using sustainable practices from growing their feeds, to nutrient management, and consumer education
- Indiana’s milk price, while higher than the national average, is competitive due in part to its location to markets
- Indiana possesses the natural resources to grow its dairy industry - an abundance of crop production and water to support animal agriculture, including approximately 40 inches of rainfall every year
- Indiana has good access to average cost skilled labor
- Indiana is an agriculturally driven state and tends to be agriculturally friendly

4.2 Opportunities

- Educate the dairy industry on the long term benefits of investing in milk production and dairy processing in the state of Indiana, so that Indiana is seen as a natural contender for further dairy expansion and processing investments
- Facilitate permitting of CFOs to grow milk supply beyond the Northwest region of the state
- Build an alliance among key dairy cooperatives to supply milk for an Indiana-based large, efficient proprietary cheese plant similar to Southwest Cheese in Clovis, New Mexico
  - This would provide a viable east of the Mississippi river source of high quality cheese as an alternative to cheese manufactured west of the Mississippi purchased by food service, food ingredient, and private label retail cheese buyers
  - The growing export market (largely served out of the west coast) and higher transportation costs to the East Coast markets provide an opportunity for a large-scale cheese plant in Indiana to be economically viable

5. Strategic Recommendations

5.1 Foster Community Acceptance of Dairy Operation Expansion

- Quantify the economic impact of agriculture, and specifically dairy, to the State of Indiana
- Educate Indiana's communities about the economic importance of dairy to the State, to increase public acceptance of animal operation expansion

5.2 Establish and Support Dairy Education Programs

- Reinforce the importance of dairy to the next generation of scientists, product developers and engineers by sponsoring dairy science programs at Purdue
- Evaluate technical college programs to ensure that their two year programs equip Indiana's workforce for careers in dairy
- Consider partnering with leading dairy companies and cooperatives in Indiana to establish curriculum and ensure funding